The River...

The Ohio seems timeless as it rolls along the 981 miles from its beginning at the juncture of the Allegheny and Monongahela Rivers at Pittsburgh, Pennsylvania.

At some time in the distant past a trickle of water flowed along the path of least resistance and began the almost imperceptible task of creating a river. Nature and time and water, in amounts so large as to be impossible to conceive, produced a natural course for rain and melted snow to follow. This natural course, in part, today we call – the Ohio River.

Man from the lowest subculture and primitive origins to the most sophisticated of societies is drawn to the banks of these natural watercourses called rivers.

As man explores the past, along the banks of the Ohio, archeologists uncover his dependence attraction and relationship to this artery. Indian cultures dating back to 8,000 years B.C. have left evidence of the river's impact on their lives.

In recent history, we can trace the growth of man, his society and the use of the river to meet his needs.

The American settler was headed west and so was the Ohio. He floated downstream and located his farms and towns near the river. Before long, the settler changed the Ohio into a highway for trade, by shipping his farm goods to market. The settler knew the value of water transportation. He knew that if he carried his goods to market in a wagon, his mule could only pull a limited load. But if the same mule is harnessed to a barge, his load is increased dramatically. It's just a law of nature; things move easier on water.

When the cargo is heavy and bulky, the cost of moving it on a water highway is normally lower than any other method. That's why the Ohio River became a busy trade route. It saved money for the American settler.

At first glance, the story of the Ohio seems pretty straightforward. A long water highway, economical transportation, adding up to a busy and prosperous trade.

The Ohio River by nature is a lion, stubborn and strong-willed. You can understand the problem if you picture a rooftop during a rainstorm. When it rains, water flows in a rush; it will flow as long as the supply continues. But since the roof is steep it will run off.

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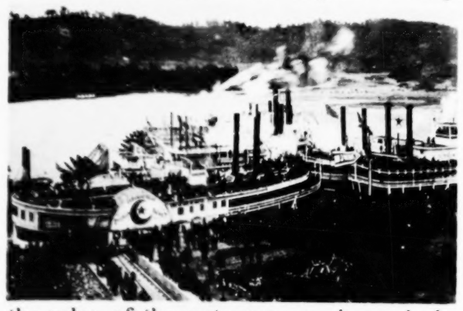
...and Man

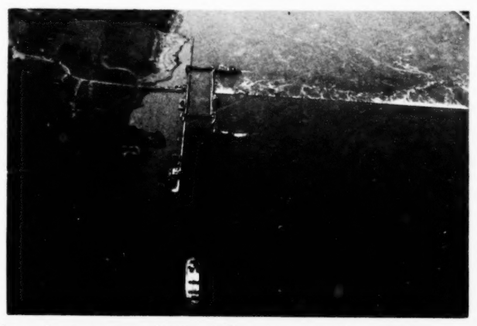
Citizens of the Ohio River valley began to rely more and more on the Ohio River to support their burgeoning economy and prosperity. So vital had this artery become that in 1824, the Congress of the United States passed the first civil works appropriation of 75,000 dollars for maintenance of the channel on the lower Ohio and Mississippi Rivers. This allowed for removal of snags and dredging to safely handle the growing traffic demands.

A number of events followed that spurred development of the Ohio to meet increasing demands. In 1825, a charter was issued by the Commonwealth of Kentucky to the Louisville and Portland Canal Company to build a canal and locks to help traffic around the only natural barrier on the Ohio, the falls and rapids at Louisville. This project was completed in 1830 and opened to traffic. Tolls were charged to users. In 1874, Congress again recognized the importance of navigable rivers to the growth of the United States. It assigned the responsibility for management of this natural resource to the U.S. Army Corps of Engineers. Part of this action resulted in the United States purchasing the financially troubled Louisville and Portland Canal Company. Government operation of navigation facilities was toll-free at the direction of the Congress of the United States.



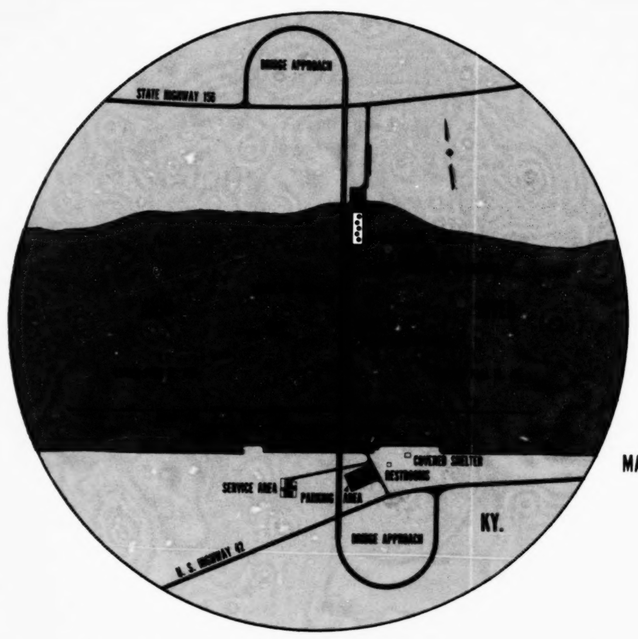
The first lock and dam constructed by the U.S. Army Corps of Engineers was at Davis Island, about 5 miles below Pittsburgh. Between its completion in 1885 and 1910, Congress provided for the construction of 12 more navigation locks and dams on the Ohio River. By 1910, the value of the waterway was increasingly recognized, and the government authorized the construction of 54 locks and dams to provide a navigable depth of 9 feet from Pittsburgh to the mouth of the Ohio River.

Each dam stretching from bank to bank would have been a barrier to the riverboats without the installation of a lock. The lock is a water escalator which allows boats and barges to move from pool to pool. Lock chambers either empty or fill by gravity flow to bring the boats or barges to the right elevation to move upstream or downstream.



By 1929, additions and modifications to the original plan resulted in a navigation system of 50 locks and dams (later modifications reduced this number to 46). Each of the dams on the Ohio had a lock chamber that measured 600 feet by 110 feet. With the year-round capability and the 9-foot depth, the Ohio River churned with activity.

Original estimates indicated that if 13 million tons of cargo used the system on a yearly basis that the investment would be justified. In the first year of operation, in excess of 25 million tons of cargo moved on the Ohio River. By 1950 that tonnage had grown to approximately 55 million tons.



A Typical Plan View

MARKLAND LOCKS & DAM
LOUISVILLE DISTRICT

How locks operate.

Diagram 1. The lower gates are closed; the drain valve is closed; the filling valve is open allowing the lock chamber to fill to the upper level; and the upper gates have been opened allowing the towboat to enter the lock chambers.

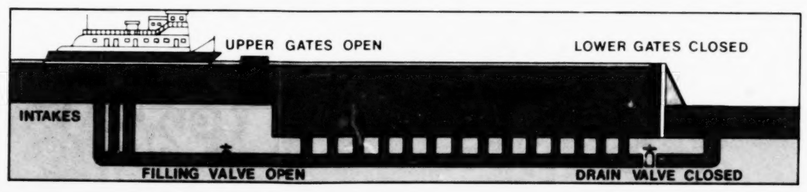


Diagram 2. Now the towboat is in the lock chamber; the upper gates are closed; the filling valve is closed; the drain valve is open allowing water to drain out into the lower level. The towboat is lowered as the water level lowers.

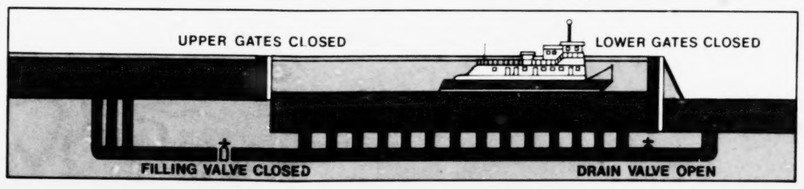
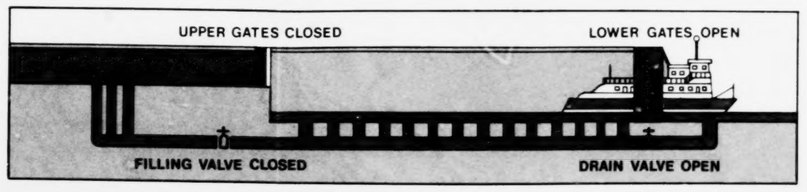


Diagram 3. When the water level reaches the lower level, the lower gates are opened allowing the towboat to leave the lock chamber and proceed on down the river to the next lock and dam where it will go through the same procedure.



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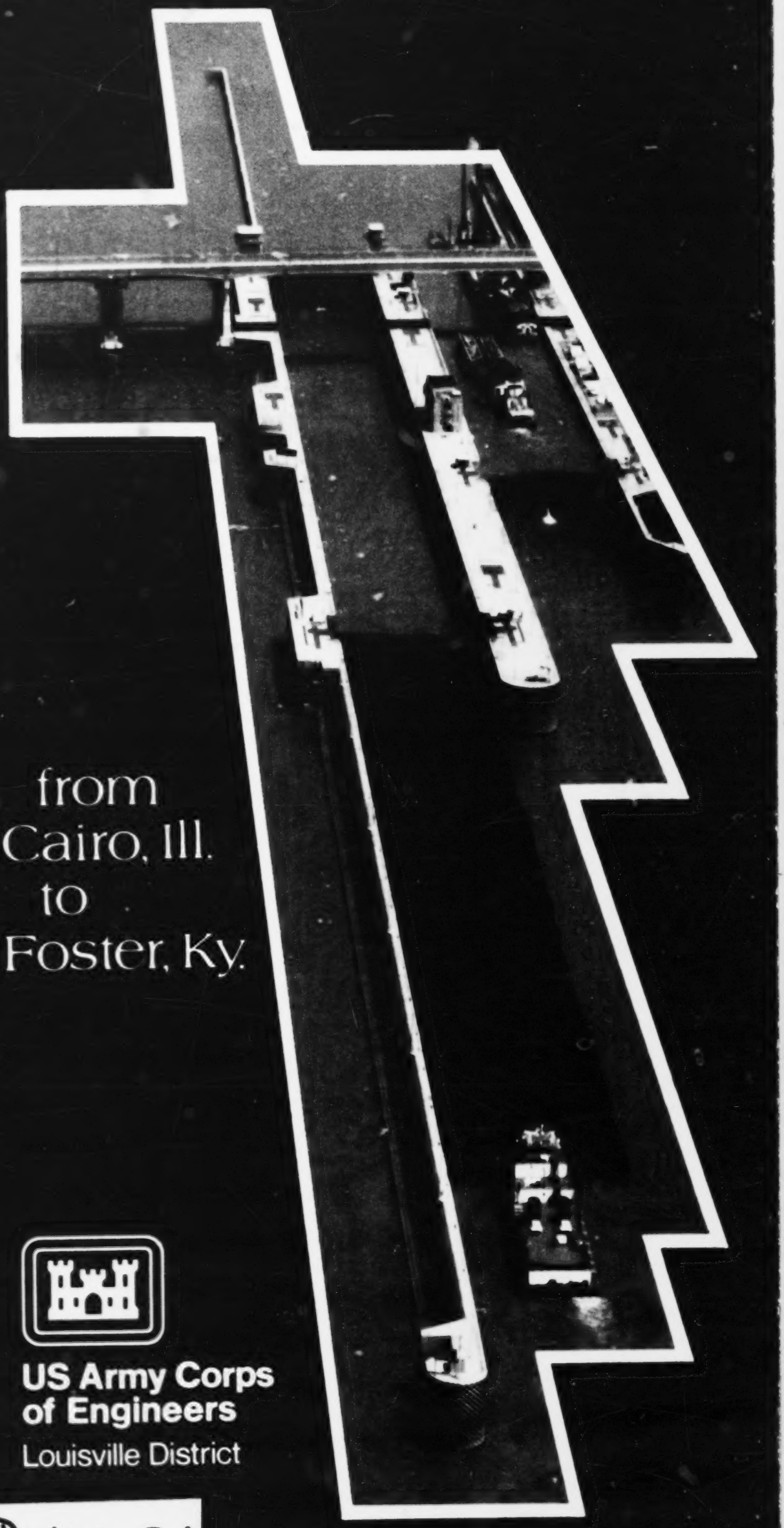
Ohio River Navigation



from
Cairo, Ill.
to
Foster, Ky.

US Army Corps
of Engineers
Louisville District

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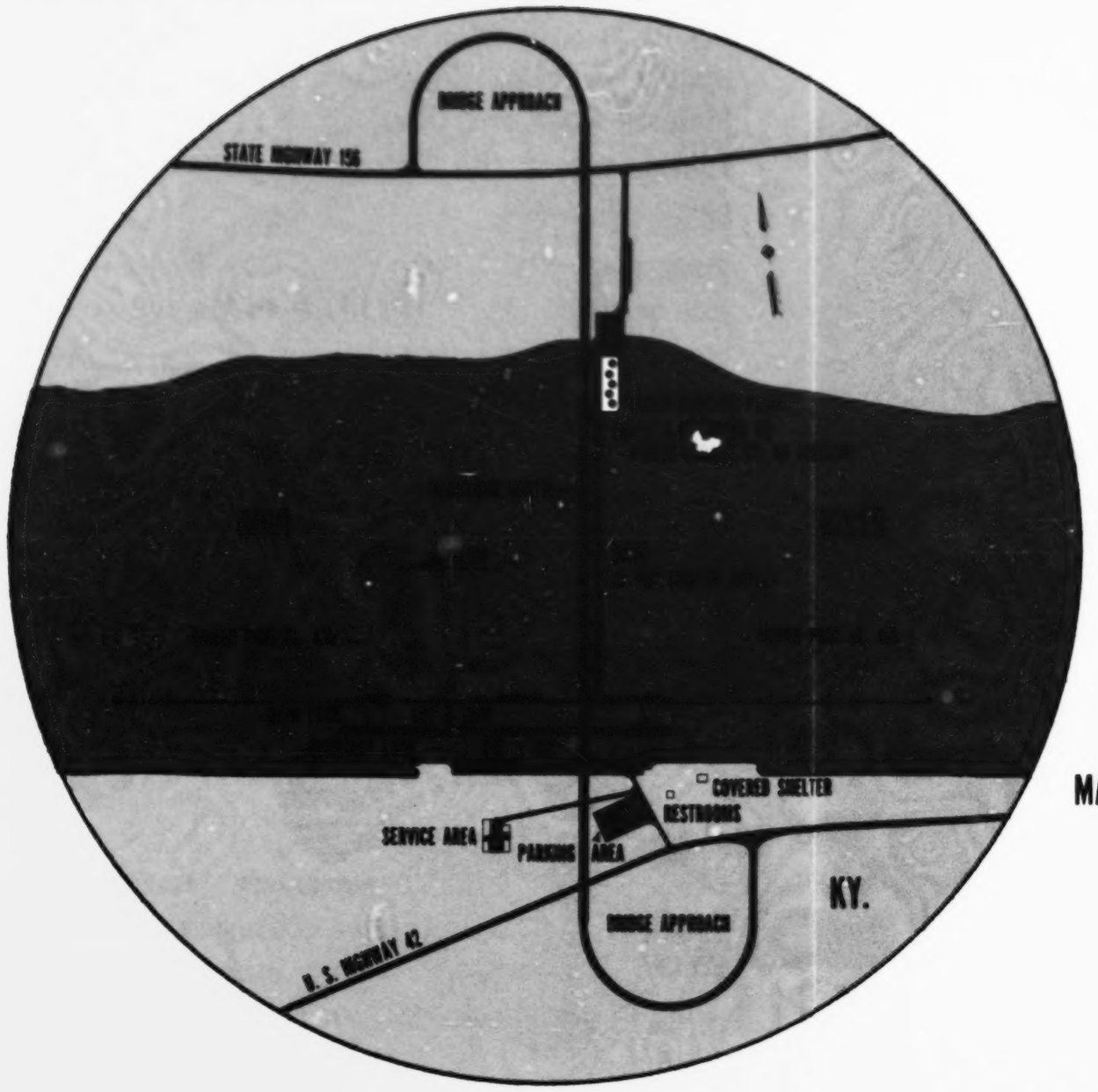

A Typical Plan View

MARKLAND LOCKS & DAM
LOUISVILLE DISTRICT

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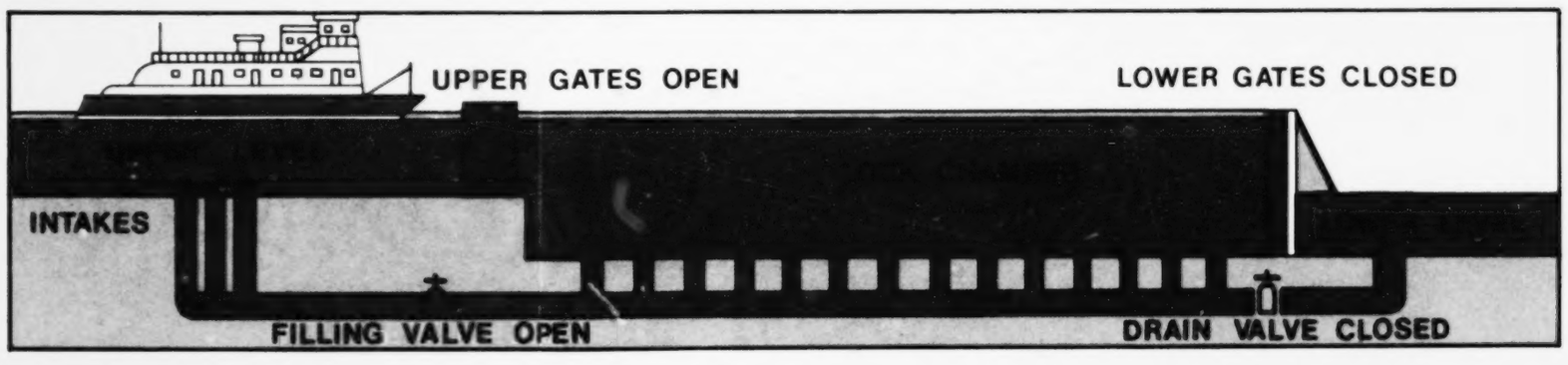

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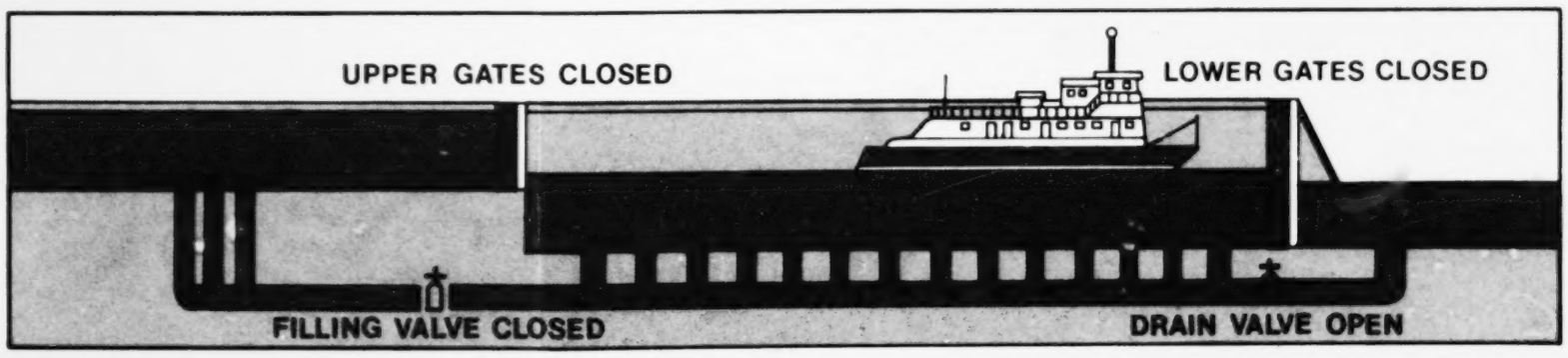

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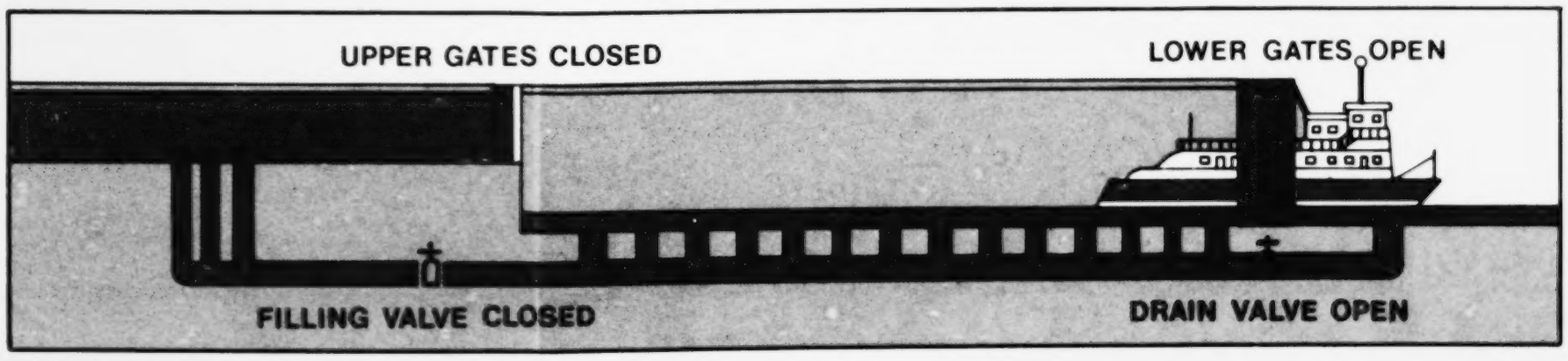
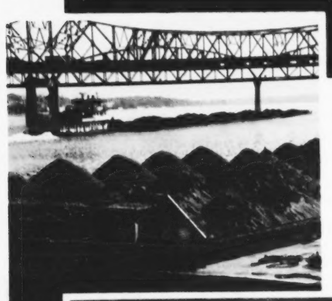
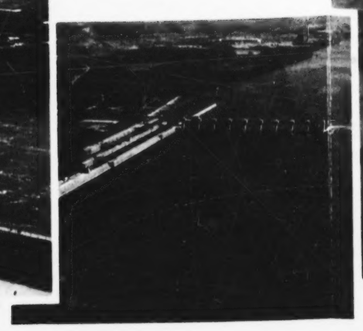
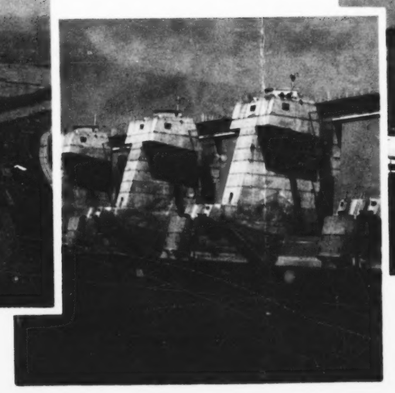








The "NEW" Ohio

The advent of diesel-powered towboats, coupled with the demand for increased tonnage, produced tows which often surpassed the 600-foot capacity of the existing lock chambers. When this occurred, it was necessary to break the tow and lock it through in two sections, using cables and winches to move the first section out of the chamber. The tow was then reassembled to proceed to the next lock where the process would be repeated. This procedure, called "double locking," was a hazardous operation and often required two to three hours to complete. The result was a five-o'clock rush hour, 24 hours a day.

The Corps of Engineers then began work on a Modernization Program to replace most of the 46 old locks and dams with 19 modern high-lift dams with larger lock chambers. The new dams allowed for more efficient regulation of the flow of the river.

The new dams are of the high-lift, movable gate type; each one contains enough concrete to build 70 miles of Interstate highway. These new structures are colossal compared to the old style, able to raise or lower a tow as much as 37 feet. The dams, with the exception of Smithland Locks and Dam, have at least two separate locks, one 1200 feet long and the other 600 feet long. It cost less to build these 19 new locks and dams than to repair or modernize the old ones. With a fully modernized Ohio River, the valley and the nation prospered anew.

The Louisville District's area of responsibility for maintaining navigation capability on the Ohio River begins at river mile 438.0 (at Foster, Kentucky, approximately 3 miles downstream from the Capt. Anthony Meldahl Lock and Dam) and extends downriver to Cairo, Illinois, where the Ohio River joins the Mississippi River (river mile 981).

In this stretch of the Ohio River are five new locks and dams that have been completed since the mid 50's and three that have been extensively rehabilitated to meet the increased demand from the river traffic that moves daily in this reach of the river.

NEW PROJECTS

Project Name	Construction Started	Construction Completed
Markland	1956	1963
Cannelton	1963	1974
Newburgh	1965	1975
Uniontown	1965	1975
Smithland	1971	1979

REHABILITATION PROJECTS

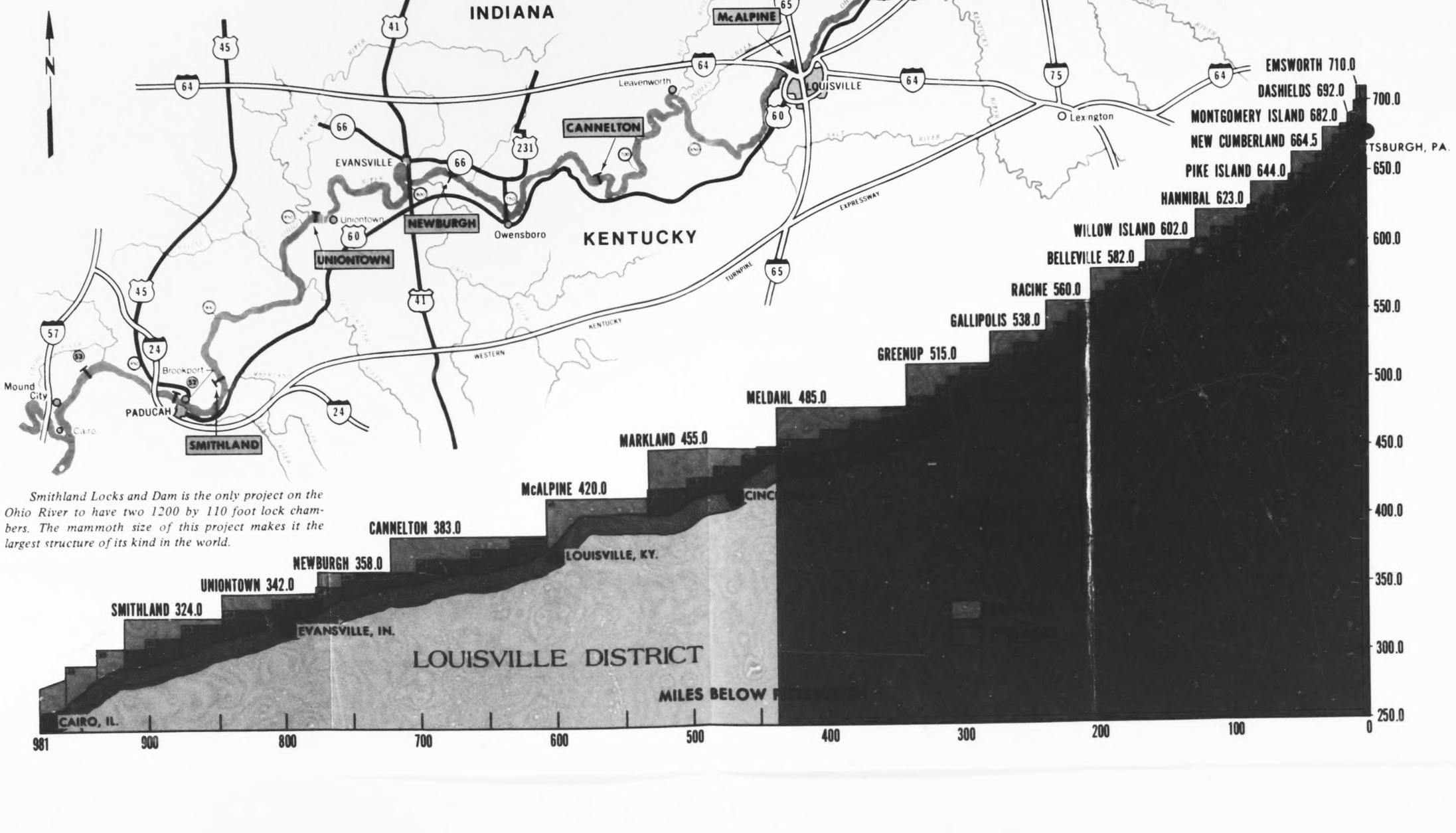
Project Name	Construction Started	Construction Completed
McAlpine	1958	1965
Lock & Dam 52	1968	1969
Lock & Dam 53	1974	1980

McAlpine Locks and Dam, located near the Falls of the Ohio at Louisville, Kentucky, is unique in that the dam portion of the structure is in the shape of the letter "Z" as it stretches from bank to bank across the Ohio River. It also is the only project on the entire 981-mile stretch of the Ohio that was located to provide passage around a natural barrier (The Falls).

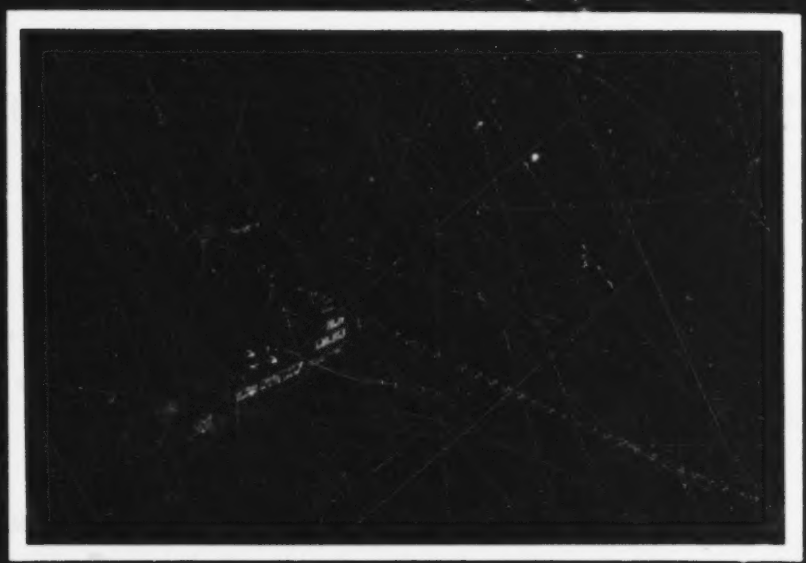
Locks and Dams 52 and 53 in the lower portion of the river are actually remnants of the original 1929 system. Temporary 1200-foot locks have been built at these projects to handle the traffic that moves in this area. These are low-cost structures that provide an immediate relief to the traffic jam (as much as 3-day waits) that was occurring. (An information brochure is available on these two projects that details the type of construction and operation of these projects.)

The Ohio River . . . its waters swift with ambition, steeped with the promise of greatness, new as tomorrow, is ready to meet the challenges of its people. It's a new Ohio today, serving the residents of the Ohio Valley by contributing to a quality lifestyle.

The Ohio River in the Louisville District



Smithland Locks and Dam is the only project on the Ohio River to have two 1200 by 110 foot lock chambers. The mammoth size of this project makes it the largest structure of its kind in the world.



Additional information may be obtained from the Lockmaster at the Project or write the District Engineer, U.S. Army Engineer District, Louisville, P.O Box 59. Louisville, Kentucky 40201.